Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept** **Setup Start**

Revision ID: **Stop**

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**

Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**

Reference:

Run Start

Approvals: **Process Plan:** M **Date:** 10-9-07 **Tooling:** _____ **Date:** _____ **Stop**

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	**Revision Nbr**								
D350-748-241	Rev E								
100		0.00							
DC	DOCUMENT CONTROL								
Document Control	**Memo**	0.00							
	Photocopy bluefile & type labels per PPPD350-748-201 CHG~~001~~ 002 per ECN10-504 if new matl used								
110		0.00							
CNC Bend 2	BENDING MACHINE - CROSSTUBES								
CNC Alpha 160 Bender	**Memo**	0.00							
	Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT_____								
120	QC15- Crosstube Dimensional Check	0.00							
QC	**Memo**	0.00							
Quality Control									

for CL 11-8-23

5 wks/es

DTO

11-8-09

11.08.09

B61773 D350-748-201

Dart Aerospace Ltd

W/O: 61773

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-201 PAR #: N/A Fault Category: Crosstube. NCR: (Yes) No DQA: M Date: 11.08.29

11-748 Resolution: re-work Disposition: re-work QA: N/C Closed: CK Date: 11/08/29

NCR:

WORK ORDER NON-CONFORMANCE (NCR)

DATE	STEP	Description of NC Section A	Corrective Action Section B: Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
11.08.08	110	Tube bent high. +0.275" from nominal on one side ~~LOT~~ Process	CP 11.8.08 DS/042	Trim 0.06" - 0.12" from high side. Now 31.54" high. Acceptable	11-8-9	JW 11-08-09	CP 11.08.08 DS 042	S 11/08/09

NOTE: Date & initial all entries

Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept** **Setup Start** **Stop**

Revision ID:

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**

Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____ **Run Start** **Stop**

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
125		0.00							
HandFXtube						(1)			
Hand Finishing Crosstubes	**Memo**	0.00							
	Stress relief	temp 375	SAD 11-08-05						
	Heat treat crosstube as per QSI010 4.3	Start 4h30							
		Finish 8h30							
127	QC5- Inspect part completeness to step on W/O	0.00							
QC		8 11/05/05							
Quality Control	**Memo**	0.00							

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept** **Setup Start** **Stop**

Revision ID:

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**

Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____ **Run Start** **Stop**

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130		0.00							
Crosstubes	Crosstubes					(V)			
Crosstubes	**Memo**	0.00							
Crosstubes	1-Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs, Set-up drill table as per QSI 010		JW	11-08-09					
	2-Deburr		SAD	11-09-09					
	3-Engrave Part # and Batch # as per Dwg D350-748-241								
	4-Remove all marks from tube within limits of D350-748-241								
	5- Apply a light coat of LPS3 on the interior of tube Batch: M109956		SAD	11-03-10		(1)			
140	QC6- Inspect dimensions to drawing	0.00	& w/os/co						
QC						(0)			
Quality Control	**Memo**	0.00							

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept**

Revision ID:

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00

Required Date: 9/20/2010 **Req'd Qty:** 1.00

Reference:

Cust Item ID:

Customer:

Setup Start

Stop

Run Start

Stop

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Outsource process-Cadplate per QSI017 4.1.9.1	0.00				CL	11/08/10	(1)	
Outsource3	**Memo**	0.00							
Outsource process - Cad plate	Issue P/O: 14653 Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possibe Supplier: Southwest United Industries Ensure Certificate of Conformity is attached								
160	Receive & Inspect for Damage & Mat'l Certs	0.00				CL	11/08/22	(1)	
Packaging	**Memo**	0.00							
Packaging	Ensure certificate of conformity is attached								
170	QC5- Inspect part completeness to step on W/O	0.00							
QC	**Memo**	0.00							
Quality Control									

11/08/22

PTO

Dart Aerospace Ltd

W/O: 61773

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.08.22	171	GEAR LOADED TO 3000 lb FOR 1 MINUTE ~~PER~~ PER ATTACHED D.S. EMAIL	~~CY~~	11/08/27	1	11.08.22 CSTOH	
11.08.22	172	NDT tube need PO14725 CY11108123 NDT Acuren (1) 11-08-23	CY		1	11.08.22 CSTOH	11/08/22

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

WORK ORDER NON-CONFORMANCE (NCR)

NCR:

DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept** **Setup Start** **Stop**

Revision ID:

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**

Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**

Reference:

Run Start **Stop**

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00							
SprayPaint									
Spray Painting	**Memo** 0.00 1-Prime inside crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2								
190	QC14- Inspect Spray Paint	0.00							
QC									
Quality Control	**Memo** 0.00 Then,Wrap in plastic bag to protect from scratches								
200	Crosstubes	0.00							
Crosstubes									
Crosstubes	**Memo** 0.00 1-Install Ground wire Insert,then insert screw and washer 2-Install Abraision strips as per Dwg D350-748-241 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-241,Torque to 60-80 IN-LBS								

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Item ID: D350-748-201 **Accept** **Setup Start** **Stop**
Revision ID:
Item Name: Crosstube Installation, High Aft
Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**
Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**
Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____ **Run Start** **Stop**
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 QC Quality Control	QC5- Inspect part completeness to step on W/O	0.00							
	Memo	0.00							
220 Packaging Packaging	Pick Kit	0.00							
	Memo	0.00							
230 QC Quality Control	QC4- 100% Inspect kits for completeness	0.00							
	Memo	0.00							

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 61773

Thursday, September 02, 2010 1:16:37 PM

Item ID: D350-748-201 **Accept** **Setup Start** **Stop**

Revision ID:

Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Start Qty:** 1.00 **Cust Item ID:**

Required Date: 9/20/2010 **Req'd Qty:** 1.00 **Customer:**

Reference:

Run Start **Stop**

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
Packaging	Packaging								
Packaging	**Memo**	0.00							
Packaging	Identify and pack for shipping as per PPPD350-748-201 Location: _____ PPP Rev: D								
250	QC21- Final Inspection - Work Order Release	0.00							
QC	**Memo**	0.00							
Quality Control									

11/8/25

11/8/25 MK

11-08-25

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

Thursday, September 02, 2010 1:16:42 PM

Work Order ID: 61773

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Required Date:** 9/20/2010

Start Qty: 1.00 **Required Qty:** 1.00

Comments:
IPP Rev: A New Issue 06-07-05 JLM
IPP Rev: B Update qty of MS21042L5 06-09-12 KJ
IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD
IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC
IPP Rev: E 08.12.11 Step17 was step 21 KJ Verified by:EC IPP Rev:F
10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-241TRN		Manufactured	No		B688835	110	Each	3.0000	1	1	1	11-8-4	
Crosstube Turning Detail													
				Location		**Loc Qty**		**Loc Code**					
				LG		3							
					59549	1							
					59551	1							
					59587	1							
ALS4-1032-225		Purchased	No			200	Each	5,336.000	1	1		11.08.25	
Insert													
B# 111581													
				Location		**Loc Qty**		**Loc Code**					
				PK011		5336							
					110768	5336							
AN960JD10	NAS1149D0363J	Purchased	No			200	Each	6.0000	1	1		11.08.25	
Washer													
B# 118077													
				Location		**Loc Qty**		**Loc Code**					
				ST		6							
					107715	6							

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

Thursday, September 02, 2010 1:16:42 PM

Work Order ID: 61773

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Required Date:** 9/20/2010

Start Qty: 1.00 **Required Qty:** 1.00

D2856-400	Manufactured	No		200	f	313.4060	1.181	1.243158 11-08-25

Abraison Strip

B# 71164

Location	Loc Qty	Loc Code	
ST403	313.4060421		
56626	97.4060421		
59920	216		

1- cut as per dwg D2856

D3502-1	Manufactured	No		200	Each	54.0000	2	2 11-08-25

Support

B# 61843 x2

Location	Loc Qty	Loc Code	
ST063	12		
61206	12		
ST066	42		
50287	38		
52903	4		

MS21920-20	Purchased	No		200	Each	77.0000	2	2 11-08-25

Clamp (per MIL-DTL-8783C)

B# 118236

Location	Loc Qty	Loc Code	
LG	77		
112624	6		
114687	21		
114779	24		
115057	26		

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID: 61773
Parent Item: D350-748-201
Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Required Date:** 9/20/2010
Start Qty: 1.00 **Required Qty:** 1.00

MS27039-1-10	Purchased	No		200	Each	126.0000	1	1	
Screw									

B# 117441

Location	Loc Qty	Loc Code
ST291	126	
112794	26	
112940	100	

AN4-41A	Purchased	No		220	Each	274.0000	8	8	
Bolt									

Location	Loc Qty	Loc Code
ST337	40	
ST360	234	
111424	4	
113359	30	
114941	100	
115108	100	

AN4-6A	Purchased	No		220	Each	1,418.000	16	16	
Bolt									

M117514

Location	Loc Qty	Loc Code
ST356	1418	
112933	96	
113149	19	
114523	2	
114615	1	
114941	500	
115108	300	
115457	500	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

Thursday, September 02, 2010 1:16:42 PM

Work Order ID: 61773

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Required Date:** 9/20/2010

Start Qty: 1.00 **Required Qty:** 1.00

AN5-32A		Purchased	No		220	Each	196.0000	4	4 M1175/4
Bolt									7x M1118/91

Location	Loc Qty	Loc Code
ST340	196	
113121	4	
114056	42	
114405	50	
115016	50	
115108	50	

AN960JD416	NAS1149D0463J	Purchased	No		220	Each	0.0000	32	32 M1183/84
Washer									
AN960JD516	NAS1149D0563J	Purchased	No		220	Each	34.0000	8	8 M1182/06
Washer									

Location	Loc Qty	Loc Code
ST	34	
103694	18	
107534	12	
109287	4	

D3500-1		Manufactured	No		220	Each	30.0000	4	4 B67207
Saddle									

Location	Loc Qty	Loc Code
ST424	30	
55605	2	
59422	16	
60489	12	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

Thursday, September 02, 2010 1:16:42 PM

Work Order ID: 61773

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 **Required Date:** 9/20/2010

Start Qty: 1.00 **Required Qty:** 1.00

D3501-1 Bushing	Manufactured	No		220	Each	394.0000	16	16 B67757

Location	Loc Qty	Loc Code
ST066	394	
45402	15	
45918	112	
48268	67	
53779	100	
61196	100	

MS21042L4 Nut	Purchased	No		220	Each	2,363.000	24	24 M117885

Location	Loc Qty	Loc Code
ST300	2363	
113422	68	
114523	28	
114718	16	
114784	331	
115108	1920	

MS21042L5 Nut	Purchased	No		220	Each	633.0000	4	4 M117441 11/8/25

Location	Loc Qty	Loc Code
ST139	133	
114813	133	
ST300	500	
115156	500	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

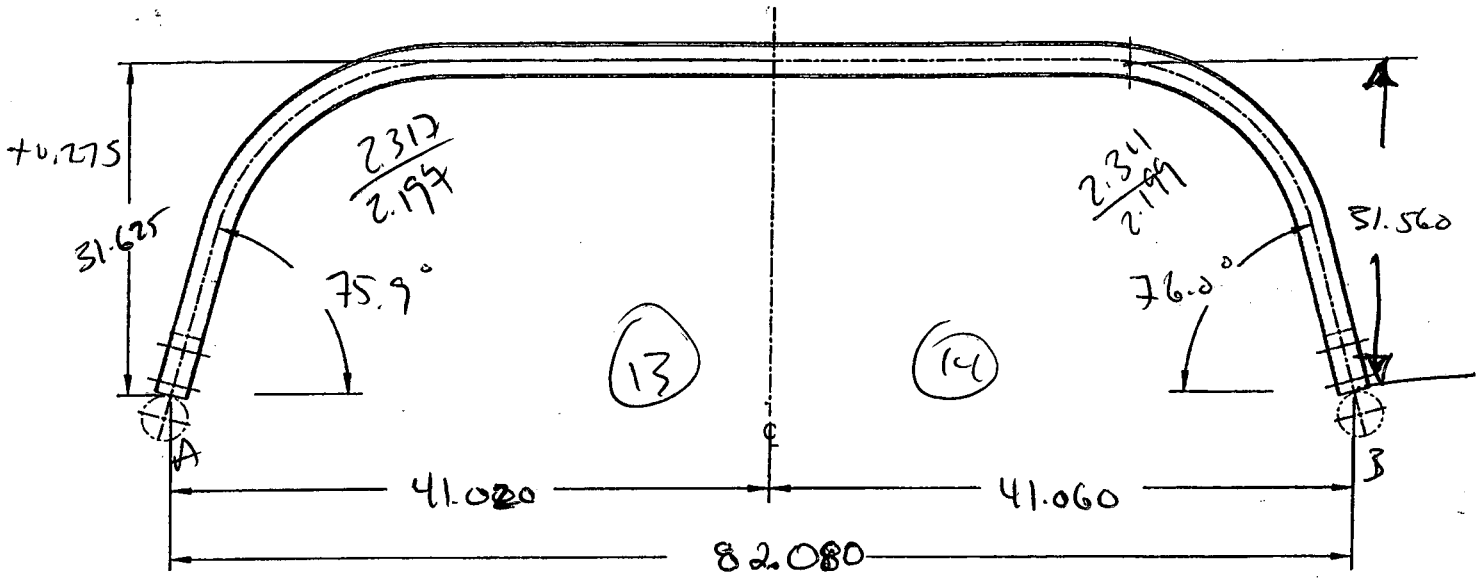
Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	41773
Description: Crosstube High Aft (AS350/355)	Part Number:	D350-748-201
Inspection Dwg: D350-748-241 **Rev:** E		Page 1 of 1

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments
twist = .109"
Side A = 2.6% crushing @ 13 passes
Side B = 24% crushing @ 14 passes

Cut 1/16" From high side

QC15 Inspection	
Date	11.09.09

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6018-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 61723
BS 10-9-02

GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6018-125
 FINISHED LENGTH = 122.700±0.06
2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
 CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2
3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
4) UNITS: INCHES UNLESS OTHERWISE NOTED.
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
7) WEIGHT: 29.85 lbs
8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2009 -10- 29

REV.	DESCRIPTION	BY	DATE
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31

DESIGN		DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D350-748-241	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30		

COPYRIGHT © 2006 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Dart Aerospace Ltd

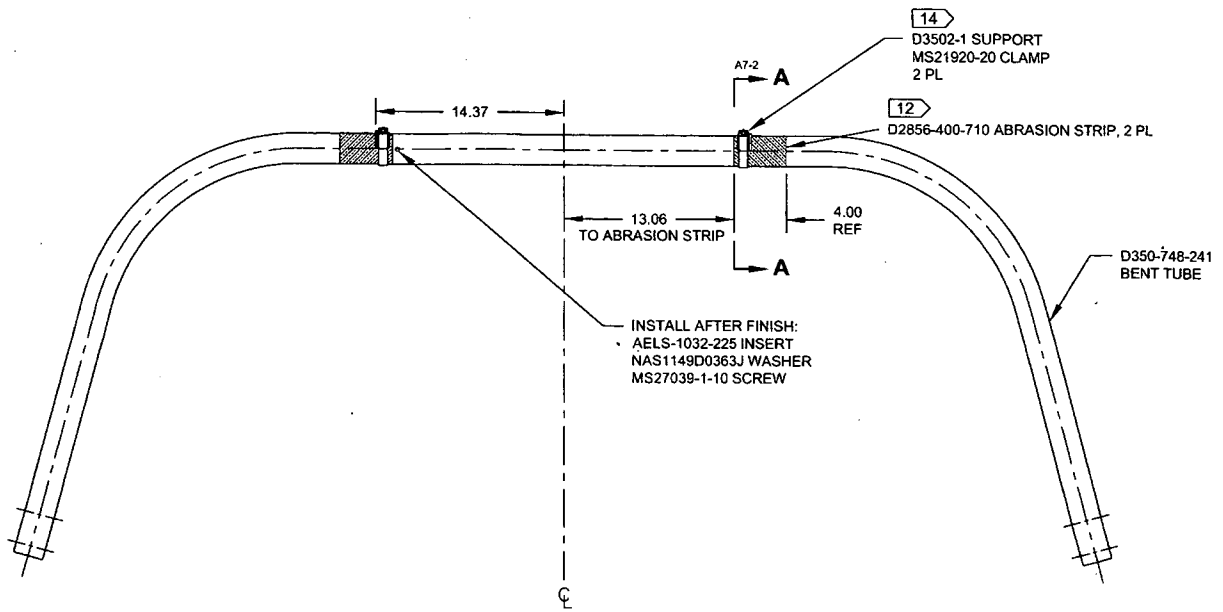
W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

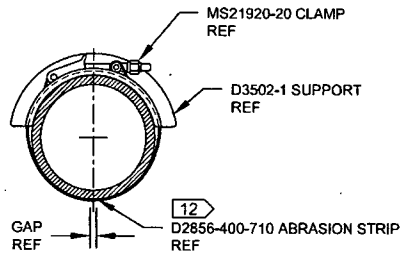
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries



D350-748-241
ASSEMBLY DETAIL

w/ 661723



SECTION A-A D4-2
SCALE 4X

RELEASED
2009 -10- 29

DESIGN		**DART AEROSPACE LTD**	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D350-748-241	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30		

COPYRIGHT © 2009 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Dart Aerospace Ltd

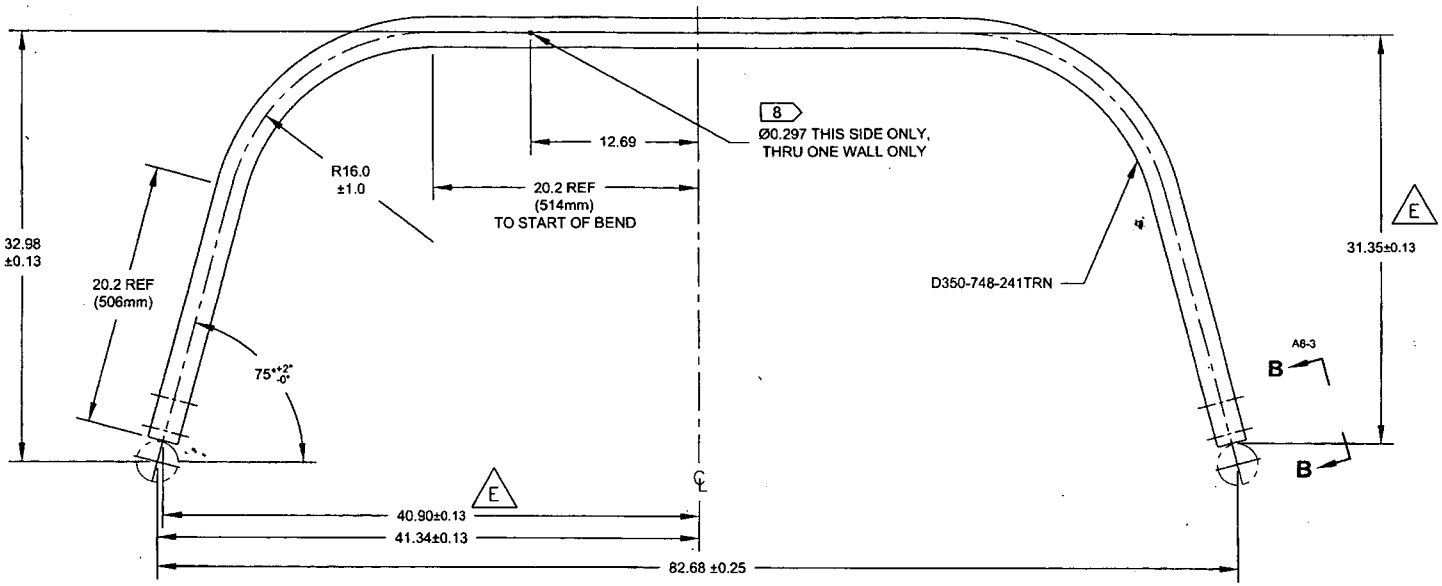
W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

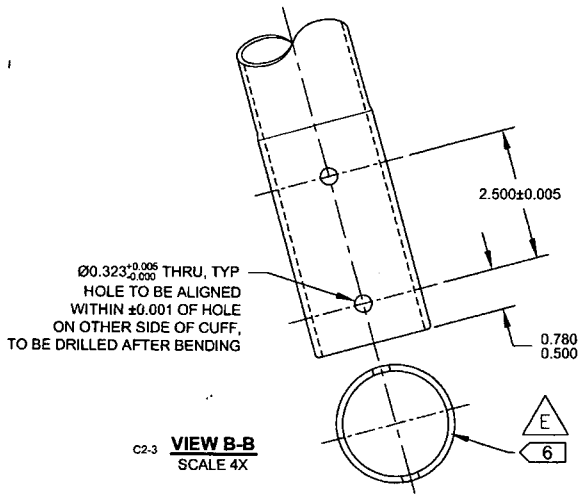
Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries



D350-748-241
BENDING AND DRILLING DETAIL 10



C2-3 **VIEW B-B**
SCALE 4X

w/o 4723

RELEASED
2009 -10- 29

DESIGN		**DART AEROSPACE LTD**	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D350-748-241	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30		

COPYRIGHT © 2006 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Dart Aerospace Ltd

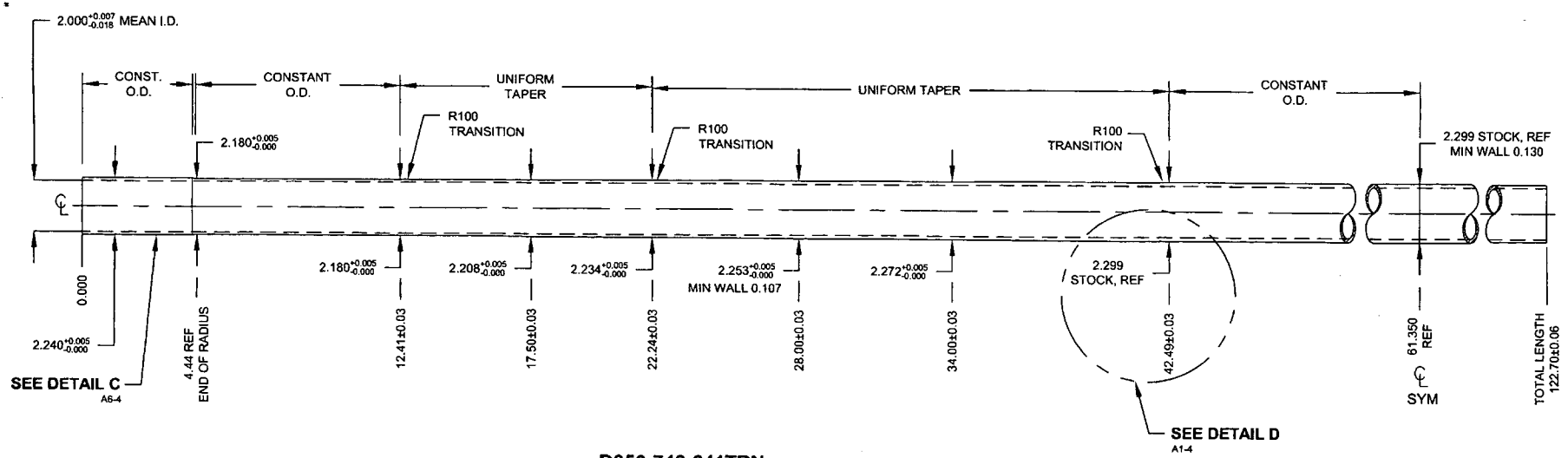
W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

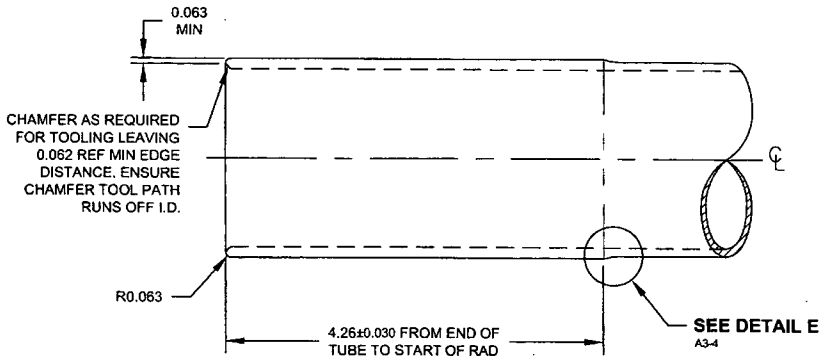
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

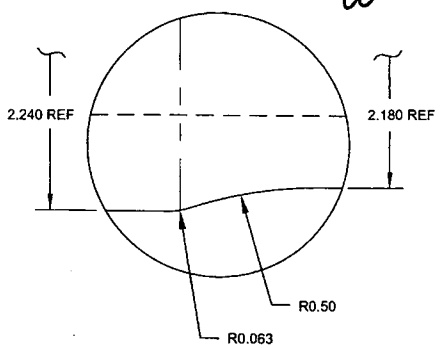


D350-748-241TRN
TURNING DETAIL

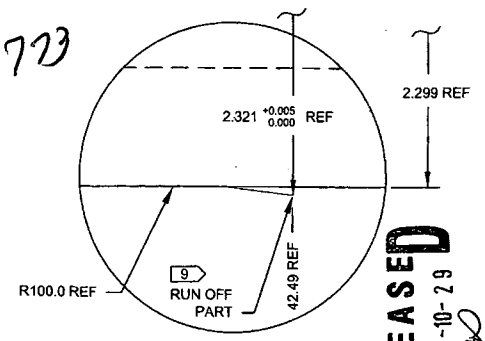
W0 61723



DETAIL C:
CROSSTUBE CUFF C8-4
SCALE 3X



DETAIL E:
CUFF TRANSITION A5-4
NOT TO SCALE



DETAIL D:
TAPER RUN-OFF C3-4
NOT TO SCALE

RELEASED
2009-10-29

DESIGN		**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	
CHECKED		DRAWING NO. D350-748-241 REV. E SHEET 4 OF 4
MFG. APPR.		
APPROVED		TITLE CROSSTUBE (AS 350/355 HI AFT) SCALE NTS
DE APPR.		
DATE 09.09.30		

COPYRIGHT © 2006 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

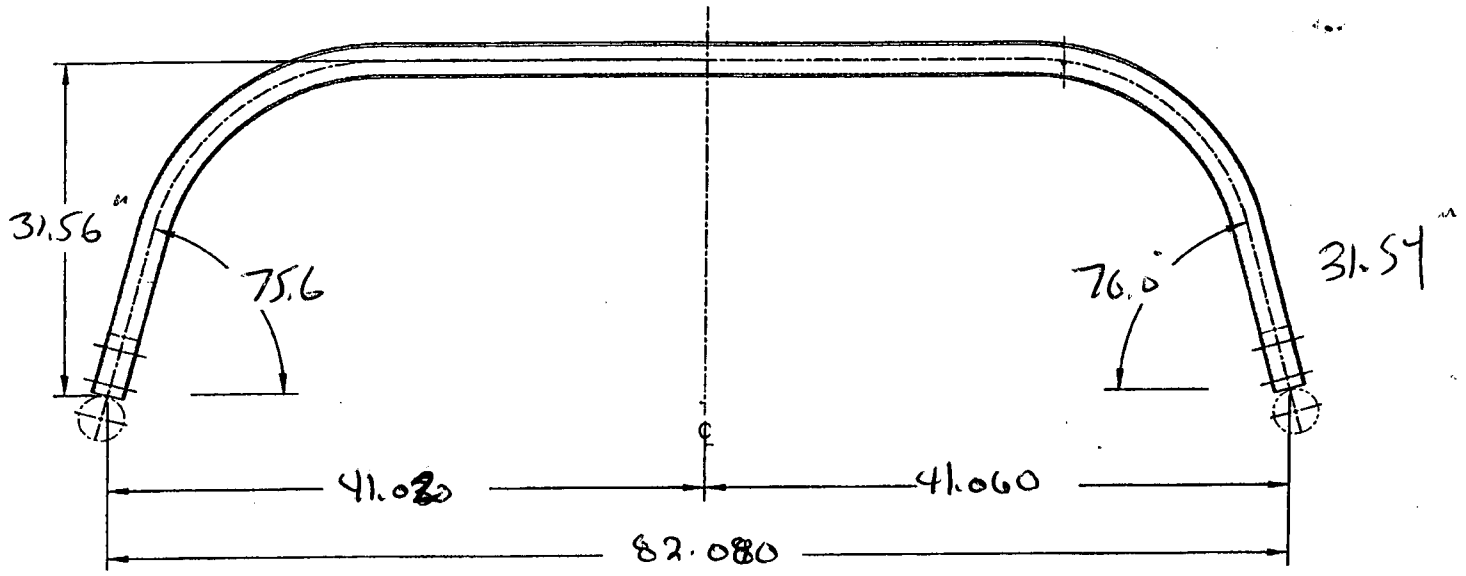
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	61773
Description: Crosstube High Aft (AS350/355)	Part Number:	D350-748-201
Inspection Dwg: D350-748-241 **Rev:** E		Page 1 of 1

After Stress Relief

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments
twist = 0.051"

QC15 Inspection	
Date	11.08.09

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

Packing Slip

Sold To:
Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

CADORATH COATING

Cadorath Coating
2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2
Phone: (204) 633-9420 **Fax:** (204) 633-8033

INVOICE NUMBER:
56257

Net 2% Interest Per Month charged on Overdue Accounts.
Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Customer Order #:	DateReceived:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
14653	Aug-15-2011	NET 30 DAYS	10071 6547 RT0001		Aug-19-2011

Item #	Qty	P/N & Description	
1	1 EA	SKID P/N d350-748-101	S/N B68519 W/O 106856
2	1 EA	SKID P/N d350-748-101	S/N B72502 W/O 106857
3	1 EA	SKID P/N D350-748-201	S/N B61773 W/O 106858
4	1 EA	SKID P/N D350-748-201	S/N B61774 W/O 106859

cL 11/08/22

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

ACUREN

LIQUID PENETRANT TEST REPORT

P- 05628

PAGE 1 OF 1

CLIENT: DART AEROSPACE
ATTENTION: LINDA / CHASTACE / IAN / MATT
ADDRESS: HAWKESBURY, ON
PROJECT: PT WET FLUORESCENT ON 4 CROSSTUBES
ITEM(S) EXAMINED: - SEE BELOW

DATE: AUG/23/2011 TIME: AM ☑ PM ☐
ACUREN JOB NO.: 183L11-02167
PO/WO NO.:
WORK LOCATION: AS ADDRESS
ACCEPTANCE STD.: ASTM 1417/CSE-038 REV./DATE: 2005

JOB DESCRIPTION | PROCEDURE NO. LT-002 REV./DATE 2008 | TECHNIQUE NO. LT-002 REV./DATE 2008

PART NO.: V STEEL & CADMIUM PLATING MATERIAL ~~Aluminum/Magnesium~~ THICKNESS N/A
SCOPE: PERFORMED A WET FLUORESCENT L.P. INSPECTION ON 100% OF THE EXTERNAL SURFACE ON ITEMS MENTIONNED BELOW

TEST DETAILS

METHOD	☑ FLUORESCENT	☐ VISIBLE			☑ WATER WASH	☐ SOLVENT REMOVABLE	☐ POST EMULSIFIED
FAMILY BRAND	MAGNAFLUX				BLACK LIGHT S/N 13798	☐ OUTPUT > 1000 µW/CM²	☑ AMBIENT < 2 fc
PENETRANT	ZL-67	MINIMUM DWELL TIME	10	MIN.	LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT		☐ OUTPUT>100 fc @ SURFACE
PENETRANT REMOVER	H2O	MINIMUM DRY TIME	>10	MIN.	OTHER		
DEVELOPER	SKD-S2	MINIMUM DWELL TIME	10	MIN.	LIGHT METER S/N	CAL DUE DATE	AUG/2012
DEVELOPER TYPE	☑ NON AQUEOUS	☐ AQUEOUS	☐ DRY				

TEST SURFACE

SURFACE CONDITION	☐ AS GROUND	☐ AS WELDED	☐ MACHINED	☐ SHOT BLASTED	☑ CLEAN BARE METAL
SURFACE TEMPERATURE	☐ < - 4°C/ 20°F	☐ - 4°C/ 20°F TO 10°C/50°F		☑ 10°C/50°F TO 52°C/125°F	☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1	CROSSTUBE W.O. ID 61773	ITEM ID	350-748-201 AFT
2	" W.O. ID 61774	ITEM ID	350-748-201 AFT
3	" W.O. ID 68519	ITEM ID	350-748-101 FWD
4	" W.O. ID 72500	ITEM ID	350-748-101 FWD

NO RELEVANT INDICATION WAS DETECTED AS PER APPLICABLE STANDARDS

NOTE: MTL: STEEL + CADMIUM PLATING

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE: Ian Titley (PRINT) _____ (SIGNATURE)

TECHNICIAN (SIGNATURE): _____

NAME (PRINT): YVES DESROSIERS

1ST TECHNICIAN		2ND TECHNICIAN	
CGSB LEVEL	SNT LEVEL 2	CGSB LEVEL	SNT LEVEL
CGSB REG. NO	2049	CGSB REG. NO	

DTR # E44717

REPORT REVIEWED BY:

NAME	INITIALS

WHITE – CLIENT COPY CANARY – OFFICE COPY PINK – TECHNICIAN COPY GOLD – OFFICE COPY